Volunteer Lake Assessment Program Individual Lake Reports

PEARLY LAKE, RINDGE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,560	**Max. Depth (m):**	5.4	**Flushing Rate (yr^{-1}):**	4.4
Surface Area (Ac.):	142	**Mean Depth (m):**	1.7	**P Retention Coef:**	0.59
Shore Length (m):	5,800	**Volume (m^3):**	1,357,500	**Elevation (ft):**	1006

TROPHIC CLASSIFICATION

Year	Trophic class
1990	EUTROPHIC
2004	EUTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

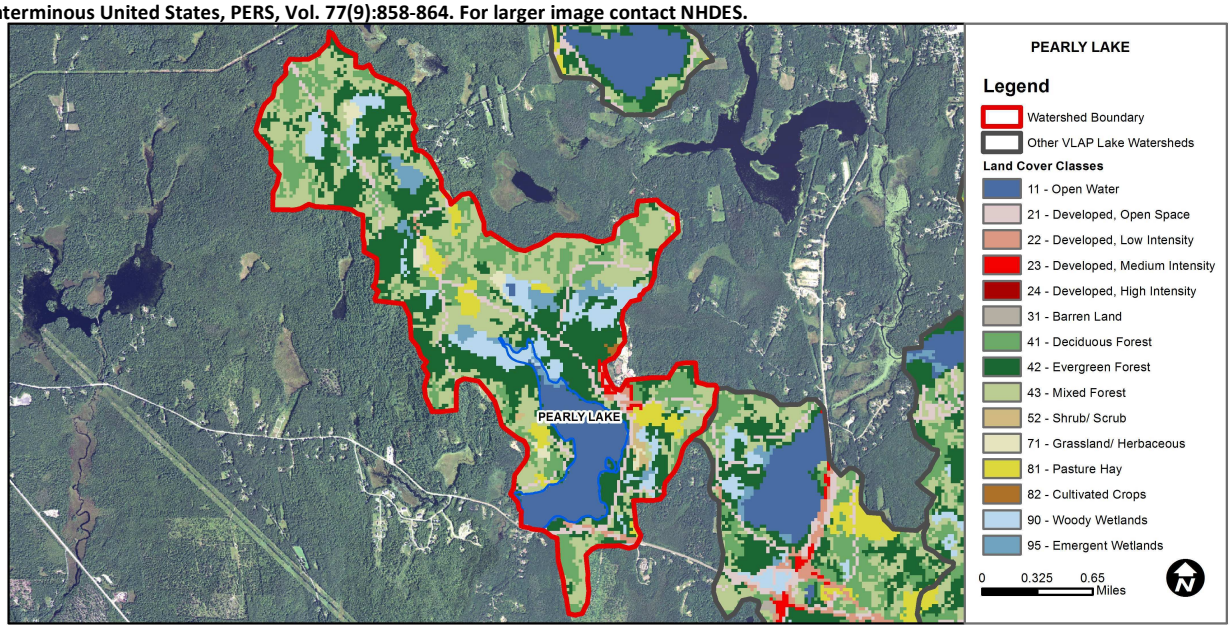
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).

BEACH PRIMARY CONTACT ASSESSMENT STATUS

PEARLY LAKE-PEARLY LAKE BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
PEARLY LAKE-PEARLY LAKE BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

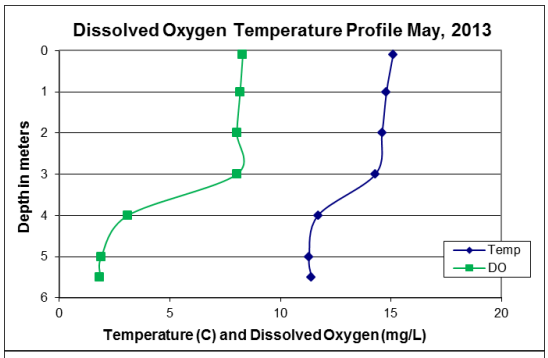


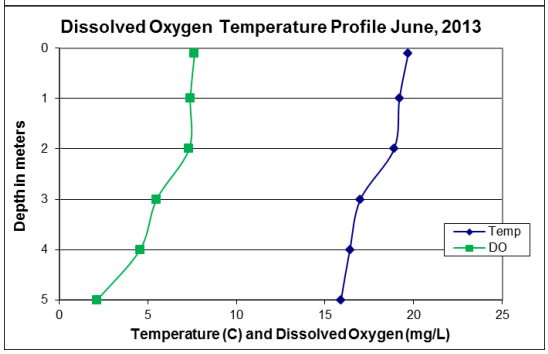
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.94	Barren Land	0	Grassland/Herbaceous	1.1
Developed-Open Space	4.97	Deciduous Forest	14.3	Pasture Hay	3.43
Developed-Low Intensity	0.74	Evergreen Forest	27.77	Cultivated Crops	0.17
Developed-Medium Intensity	0.4	Mixed Forest	27.11	Woody Wetlands	7.59
Developed-High Intensity	0.01	Shrub-Scrub	0.61	Emergent Wetlands	2.86

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
PEARLY POND, RINDGE, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were average and below the state median in May and June, were slightly elevated in July and August, and then decreased to average levels in September and October. The 2013 average chlorophyll levels were the lowest measured since monitoring began and likely the result of sampling in the spring and fall when chlorophyll levels were lower as well as the increased flushing of nutrients due to significant storm events. Historical trend analysis indicates significantly decreasing (improving) chlorophyll since monitoring began. We hope to see this continue!
- **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride were low and less than the state median in Bower Inlet. Conductivity and chloride were elevated at all other stations throughout the summer, particularly in College Rd. Inlet. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus was fairly uniform throughout the water column and in the average range of 10 to 20 ug/L in April before summer stratification, in May as the hypolimnion started to form, and in October after fall turnover. In June, epilimnetic phosphorus remained average; however hypolimnetic phosphorus started to increase (> 20 ug/L). In July and August, epilimnetic phosphorus was above average and hypolimnetic phosphorus was extremely elevated. By September, epilimnetic and hypolimnetic phosphorus levels had decreased to slightly above average. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. The same pattern was also seen in the tributaries with May and June experiencing average phosphorus levels, July and August elevated phosphorus levels as tributary flows were lower, and by September phosphorus levels had decreased back to average.
- **TRANSPARENCY:** Transparency decreased steadily as the summer progressed and chlorophyll levels increased, and improved as chlorophyll levels started to decrease in September and October. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **TURBIDITY:** Tributary turbidity was low on each sampling event. Deep spot turbidity was generally elevated in June, July and August.
- **PH:** Deep spot and tributary pH levels were lower than desirable and potentially critical to aquatic life. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **DISSOLVED OXYGEN:** DO/Temp profiles were collected monthly, however only those data collected by the VLAP biologist are represented. By July, hypolimnetic oxygen had depleted below 1.0 mg/L causing phosphorus to be released from bottom sediments.
- **RECOMMENDED ACTIONS:** The intense monitoring program of 2013 was a result of grant funds to develop a watershed management plan for Pearly Pond to address water quality impairments. Keep up the great work and hopefully development of a plan will assist in addressing phosphorus loading in the future.





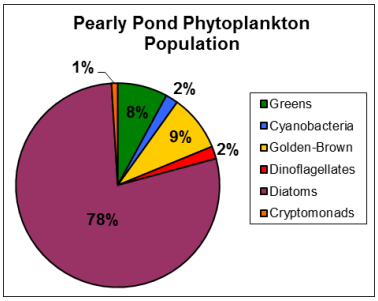


Table 1. 2013Average Water Quality Data for PEARLY LAKE

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Bower Inlet			3	18.8	21			0.56	5.40
College Rd Inlet			56	235.3	24			0.71	5.57
Epilimnion	1.96	5.03	20	100.1	21	1.31	2.05	1.48	5.81
Hypolimnion				105.7	60			4.50	5.82
Mountain Rd			17	87.9	40			0.71	5.43
Outlet			23	99.5	20			0.76	5.97

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Improving	Data significantly decreasing.
Conductivity	Degrading	Data significantly increasing.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.